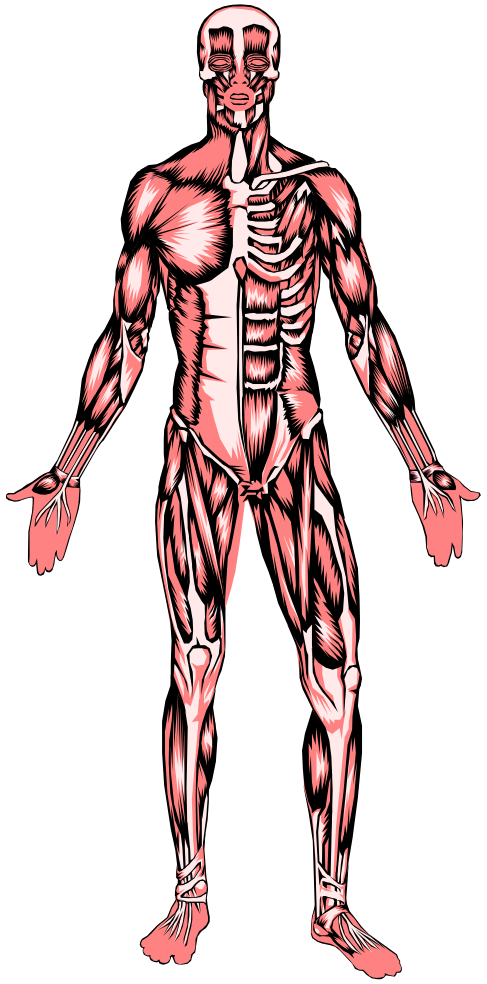
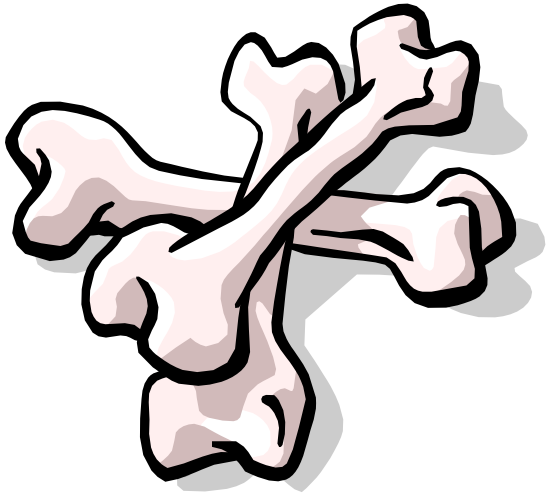
THE MUSCLE SYSTEM



Structure & Function

Forms the body framework

Enables the body to move



Protects and supports internal organs

Consists of bones, joints and muscles

Structure & Function

Bones

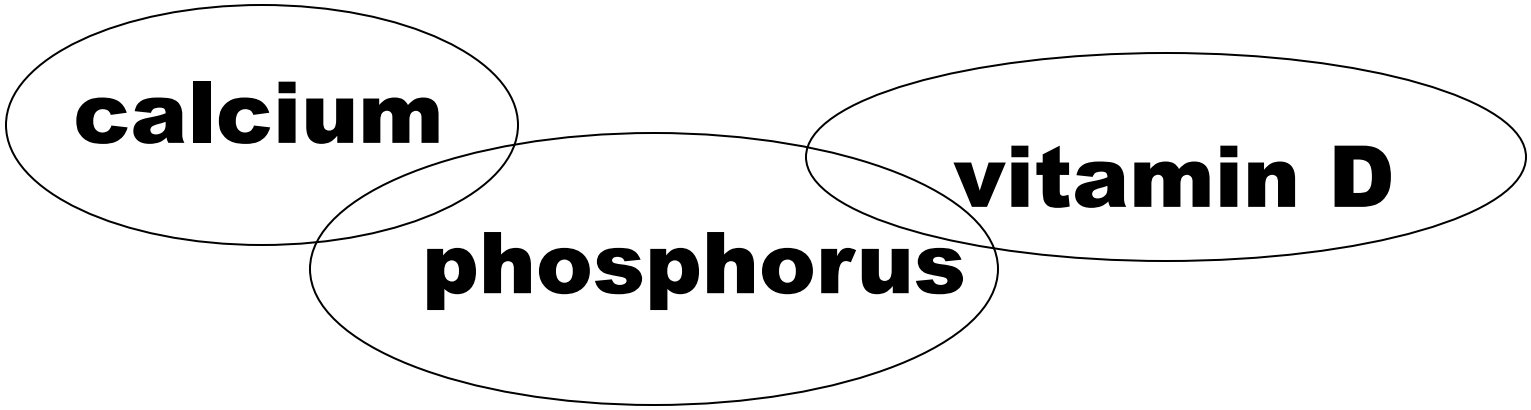
- Composed of osseous tissue
- Consists of a rich supply of blood vessels and nerves
- **Osteoblasts** are bone-forming cells
- **Osteoclasts** are responsible for reabsorbing dead bone tissue
- Bone cells are called **osteocytes**

Structure & Function

Bones

The development of osteocytes and the hardening process is called ossification.

Ossification depends on:



Structure & Function

Bones

The adult skeleton has 206 bones.

Common Bone Categories

- **Long bones (Femur)**
- **Short bones (Wrist bones)**
- **Flat bones (Skull)**

- **Irregular bones (Vertebrae)**
- **Sesamoid bones (Kneecap)**

Structure & Function

Bones

Parts of long bones:

- **The shaft is the longest portion also called the diaphysis.**
- **The ends are called the epiphysis.**
- **Space between the epiphyses and the diaphysis is called the metaphysis.**

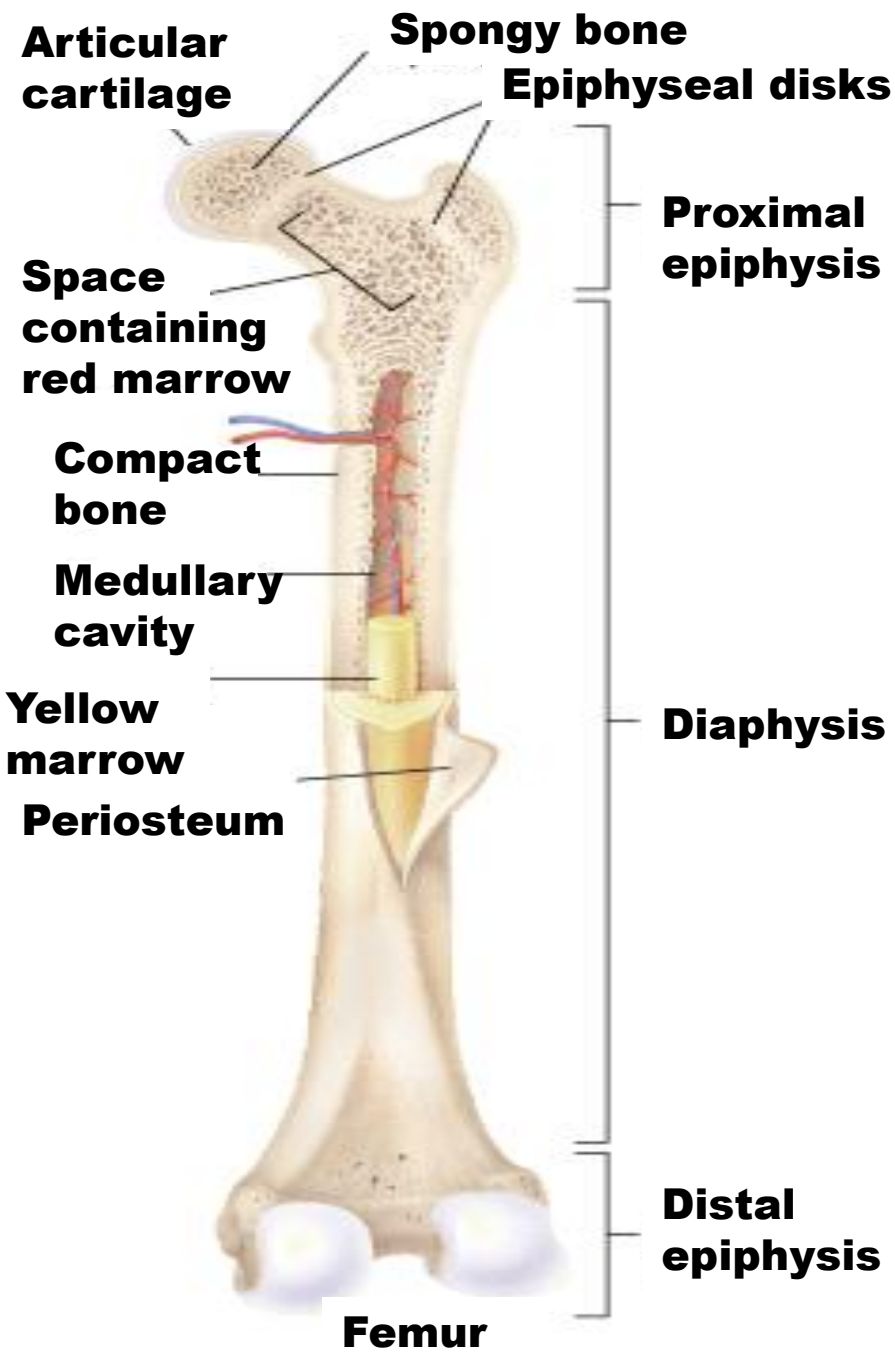
Structure & Function

Parts of a long bone

- **Articular cartilage** is a thin flexible substance that provides protection at movable points.

- **Medullary cavity** contains yellow bone marrow.

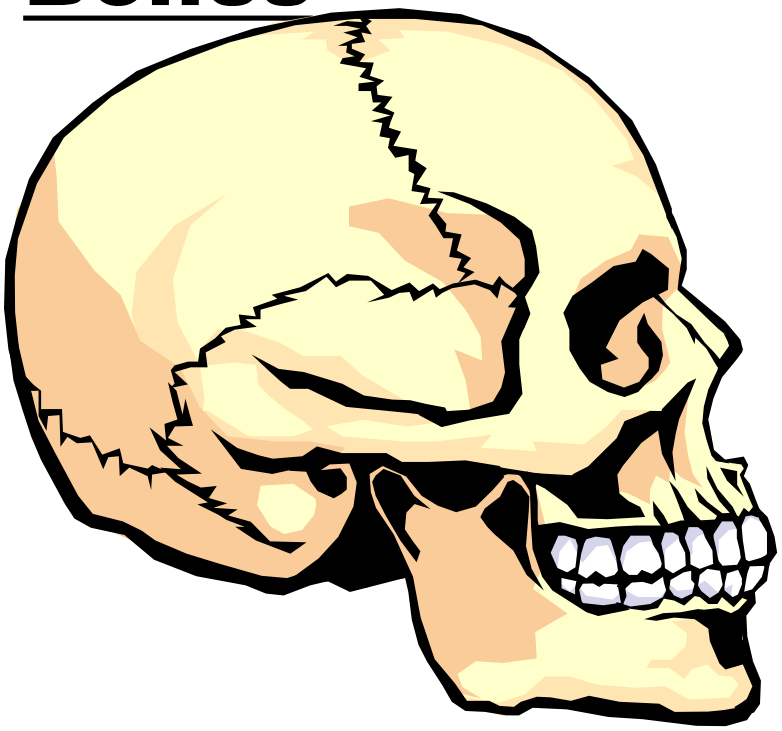
- Red bone marrow is found in infant bones and the flat bones of adults.



Structure & Function

Cranial Bones

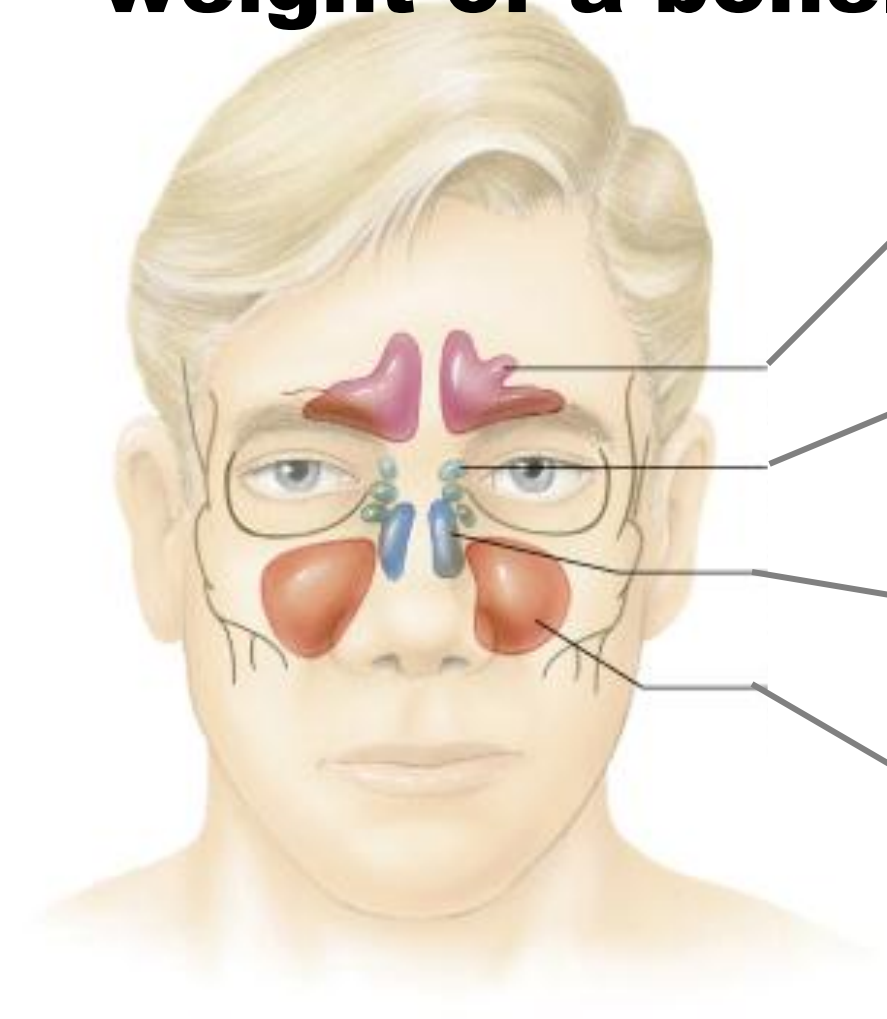
- Temporal
- Frontal
- Sphenoid
- Occipital



- Parietal
- Ethmoid

Structure & Function

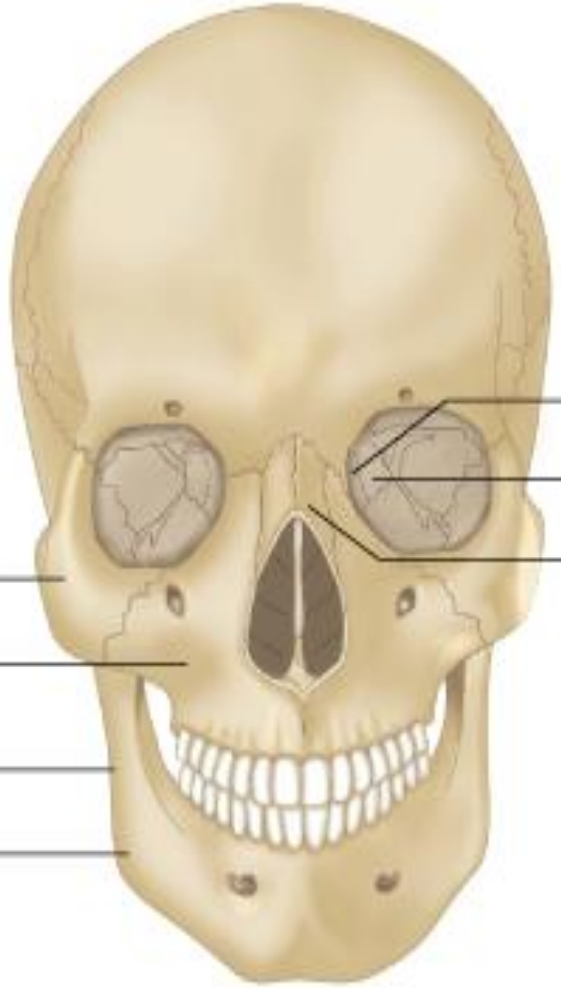
Sinuses are cavities that reduce the weight of a bone.



- **Frontal sinuses**
- **Ethmoid sinuses**
- **Maxillary sinuses**
- **Sphenoid sinuses**

Structure & Function

Facial Bones



- Lacrimal bone
- Ethmoid bone
- Nasal bones

Zygomatic bone

Maxillary bones

Mandible

Palatine bone

Structure & Function

Spinal Column

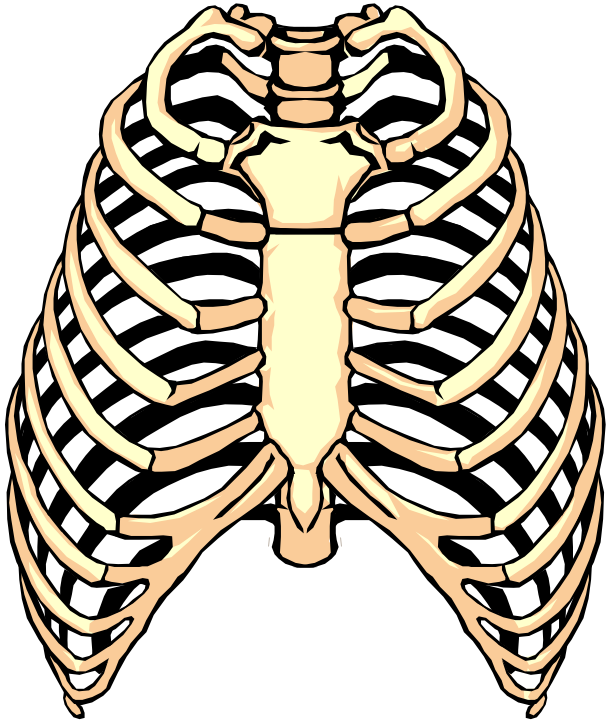
Consists of five sets of vertebrae

- **Cervical = 7**
- **Thoracic = 12**
- **Lumbar = 5**
- **Sacrum = 5**
- **Coccyx = 1**

Structure & Function

Bones of the Chest

- Clavicle
- Scapula
- Sternum

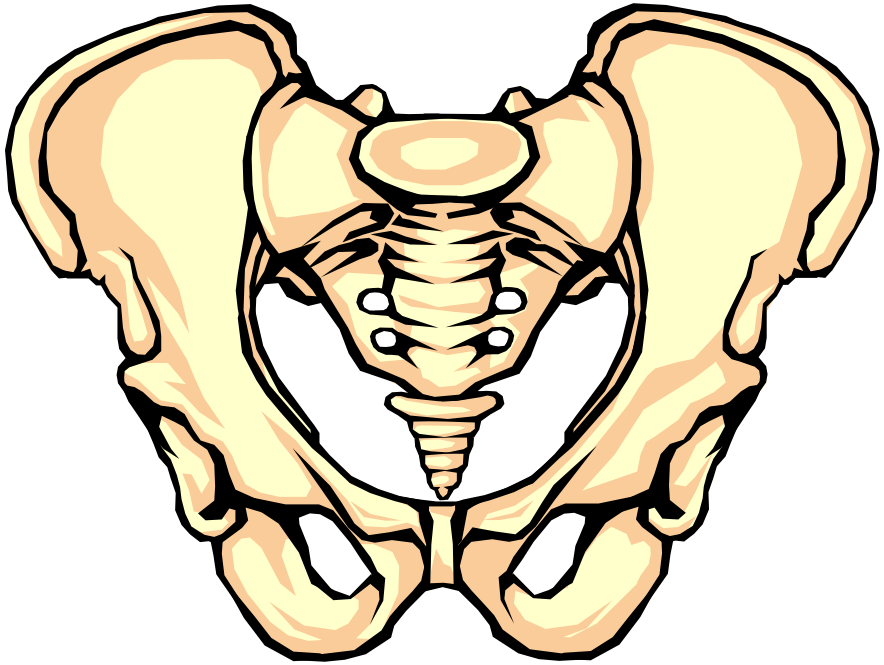


- True ribs
- False ribs
- Floating ribs

The chest cavity is also referred to as the thoracic cavity.

Structure & Function

Bones of the Pelvis



- ilium
- ischium
- pubes
- pelvic cavity

The pubic symphysis is where both pubic bones join.

Structure & Function

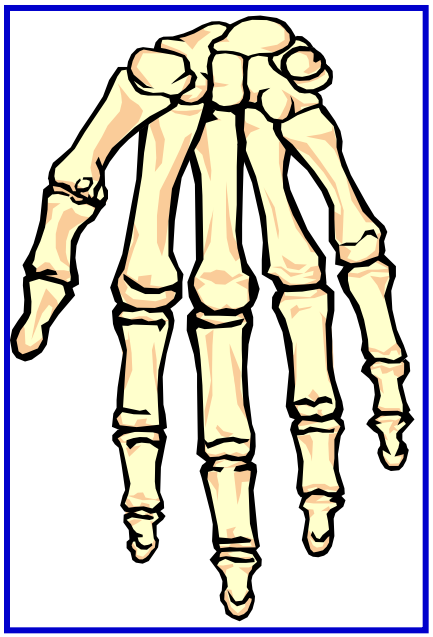
Bones of the Extremities

Upper Arm

- Humerus

Lower Arm

- Ulna
- Radius



Hand and Fingers

- Carpals (wrist)
- Metacarpals (palm)
- Phalanges (fingers)

Structure & Function

Bones of the Extremities (Cont'd)

Upper Leg

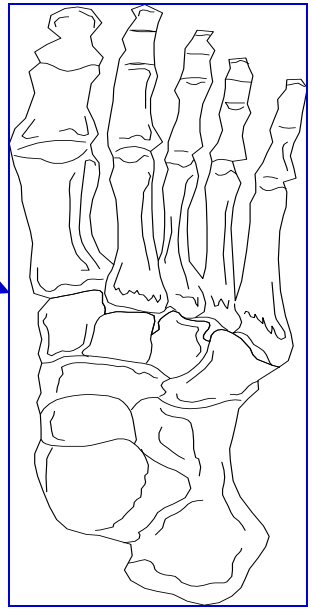
- Femur

Lower leg

- Tibia (shin)
- Fibula
- Patella (kneecap)

Feet and Toes

- Tarsals
- Calcaneus (heel)
- Metatarsals
- Phalanges



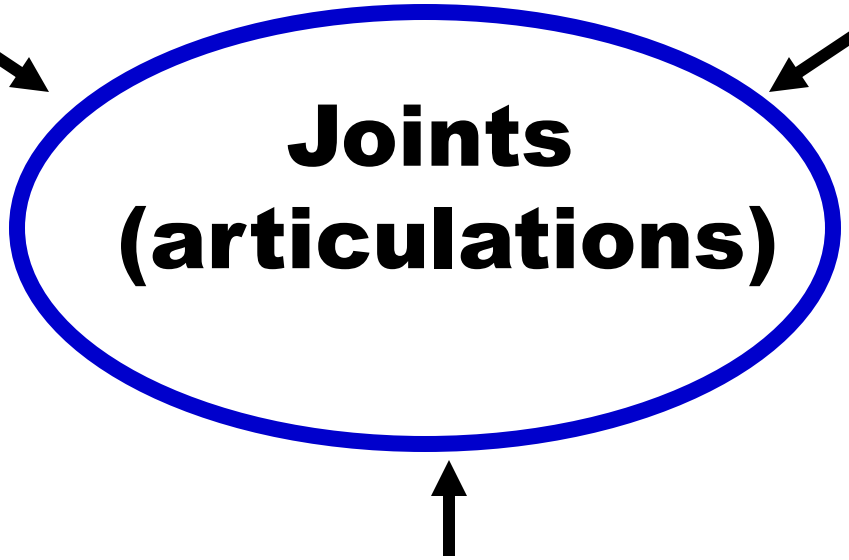
Structure & Function

Amphiarthroses

- Moves slightly

Diarthroses

- Moves freely



Synarthrose

- No movement

Structure & Function

Tendons and Ligaments

Tendons are bands of fibrous tissue that connect muscles to bone.

Ligaments connect bones to other bones.

A joint lubricator (**synovial fluid**) helps synovial joints move easier.

Movement occurs at joints with the assistance of **muscles**, tendons and ligaments.

Structure & Function

Muscles

Muscles contract (shorten) and extend to provide body movement.

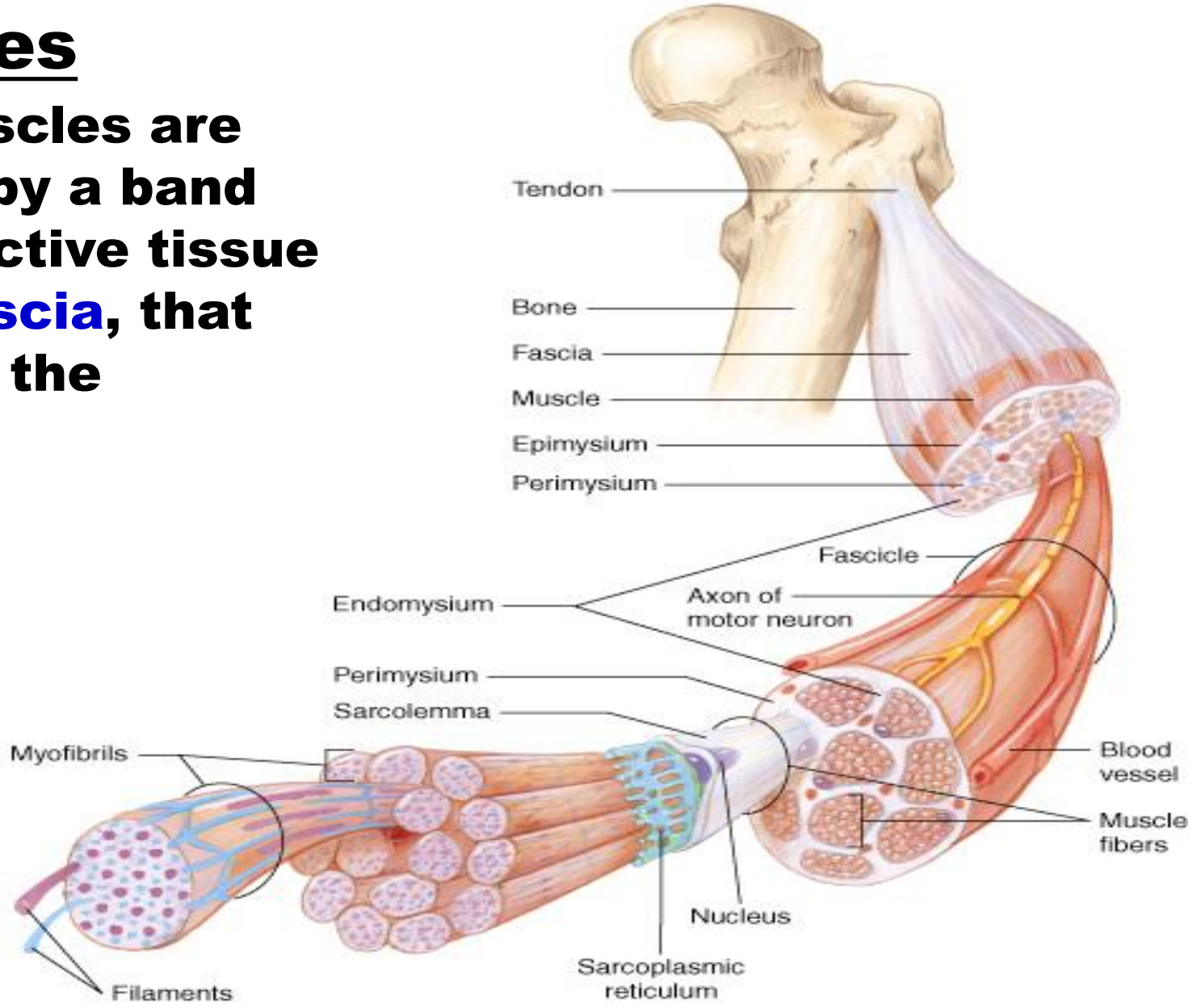
Types of Muscles

- **Voluntary (skeletal)**
- **Involuntary (smooth or visceral)**
- **Cardiac**

Structure & Function

Muscles

Most muscles are covered by a band of connective tissue called fascia, that supports the muscle.



Diagnostic, Procedural, and Laboratory Tests

Medical specialists that treat disorders of the musculoskeletal system:

- **Orthopedists**
- **Osteopaths**
- **Rheumatologists**
- **Podiatrists**
- **Chiropractors**

Diagnostic, Procedural, and Laboratory Tests

Performing internal examinations or the use of x-rays, scans, and radiographs are often required to diagnose bone and muscle ailments.

Diagnostic, Procedural, and Laboratory Tests

- Arthrography
- Arthroscopy
- Diskography
- Computed tomography (CT)
- Myelography
- Electromyogram
- Magnetic resonance imaging (MRI)

Diagnostic, Procedural, and Laboratory Tests

Laboratory tests measure the levels of substances found in some musculoskeletal disorders.

Common laboratory tests

- **Rheumatoid factor test**
- **Creatine phosphokinase (CPK)**
- **Calcium**
- **Phosphorus**
- **Uric acid**

Diagnostic, Procedural, and Laboratory Tests

Other Tests

Goniometer
-Tests for ROM

Densitometer
-Measures bone density

Goniometer

Pathology

Causes of musculoskeletal disorders

- Birth defects
- Injury
- Degenerative disease
- Systemic disorders

Pathology

Types of fractures

Complex

Incomplete

Comminuted

Greenstick

Simple (closed)

Compound (open)

Colles'

Impacted

Pathology

- Injury or trauma to the joints or muscle may cause a sprain.
- Overuse of a muscle may cause a strain.

Other conditions:

- Tendinitis
- Dislocation
- Subluxation
- Osteoporosis

Pathology

Musculoskeletal Pain and Discomfort

- Osteomalacia
- Myalgia
- Arthralgia
- Arthritis
- Tetany

Surgical Terms

Almost any major part of the musculoskeletal system can now be surgically repaired.

Supportive devices

- Cast
- Splints
- Traction
- Prosthetic devices

Surgical Terms

Reduction is the return of a part to its normal position.

Osteoplasty is repair of a bone.

Tenotomy is the cutting into a tendon to repair a muscle (**myoplasty**).

Arthroplasty is repair of a joint.

Laminectomy is removal of part of a spinal disk.